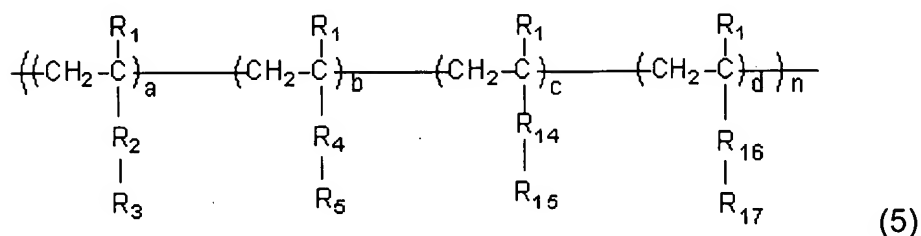


## ABSTRACT OF THE DISCLOSURE

A polymer for a chemically amplified negative photoresist and a photoresist composition are provided. A representative polymer of the invention is a compound of formula 5:

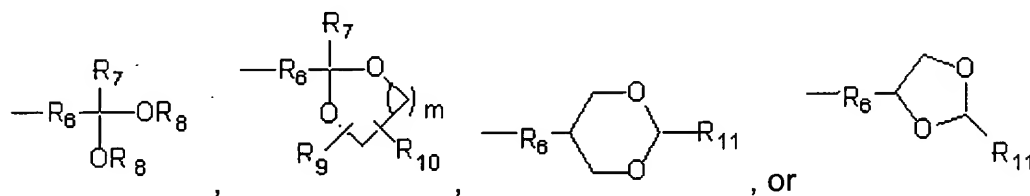


wherein:

R<sub>1</sub> is H or CH<sub>3</sub>;

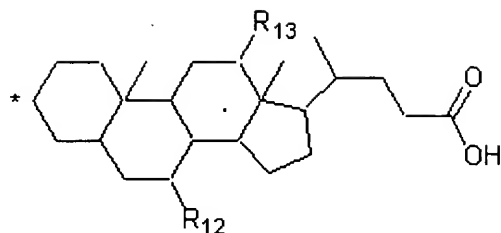
R<sub>2</sub> and R<sub>4</sub> are each independently (R)<sub>α</sub>(CH<sub>2</sub>)<sub>β</sub>R' or (R)<sub>α</sub>[(CH<sub>2</sub>)<sub>γ</sub>O]<sub>δ</sub>R' (wherein, R is CO, CO<sub>2</sub>, O, OCO, or OCO<sub>2</sub>, R' is O, CO<sub>2</sub>, or OCO<sub>2</sub>, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5);

R<sub>3</sub> is represented by one of the formula:



wherein R<sub>6</sub>, which combines an acetal compound and a vinyl compound, is a C<sub>1</sub>-C<sub>5</sub> saturated alkyl, a C<sub>1</sub>-C<sub>5</sub> ether, or a C<sub>1</sub>-C<sub>5</sub> carbonyl; R<sub>7</sub> to R<sub>11</sub> are each independently selected from H, C<sub>1</sub>-C<sub>5</sub> saturated alkyls, C<sub>1</sub>-C<sub>5</sub> ethers, C<sub>1</sub>-C<sub>5</sub> carbonyl groups, and C<sub>1</sub>-C<sub>5</sub> alcohol groups; and m is a number ranging from 1-5; and

R<sub>5</sub> is represented by formula:



wherein  $R_{12}$  and  $R_{13}$  are each independently H or OH; and

\* represents the bonding site at which the  $R_4$  group is bonded.

$R_{14}$  and  $R_{16}$  are each independently selected from a single bond  $(R)_\alpha(CH_2)_\beta R'$  and  $(R)_\alpha[(CH_2)_\gamma O]_\delta R'$  (wherein, R is CO,  $CO_2$ , O, OCO, or  $OCO_2$ ,  $R'$  is O,  $CO_2$ , or  $OCO_2$ ,  $\alpha$  is 0 or 1,  $\beta$  is 0 to 5,  $\gamma$  is 1 or 2, and  $\delta$  is 1 to 5);  $R_{15}$  is a hydroxyl group;  $R_{17}$  is a carboxyl group;

a, b, c, and d represent the mole ratios of each monomer, wherein a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that  $a+b+c+d = 1$ ; and

n represents the degree of polymerization of each polymer, and has a value of at least 2.